REMARKS

In the Final Office Action,[1] the Examiner rejected claims 1, 2, and 8 under 35

U.S.C. § 103(a) as being unpatentable over the combination of U.S. Patent Application

No. 2001/0041018 A1 to Sonoda ("*Sonoda*") and U.S. Patent No. 7,081,918 B2 to

Takemoto ("*Takemoto*"); rejected claims 3-5 under 35 U.S.C. § 103(a) as being

unpatentable over the combination of *Sonoda* and *Takemoto* and further in view of

Gonzalez, Rafael C. and Woods, Richard E., *Digital Image Processing* (2nd edition)

("*Gonzalez*"); and rejected claim 7 as being unpatentable over the combination of

Sonoda, *Takemoto*, and *Gonzalez* and further in view of U.S. Patent No. 5,517,333 A to

Tamura et al. ("*Tamura*").

Claims 1-5 and 7-8 remain pending.

Applicant respectfully traverses the rejection of claims 1, 2, and 8 under 35

U.S.C. § 103(a) as being unpatentable over the combination of *Sonoda* and *Takemoto*.

A *prima facie* case of obviousness has not been established.

Claim 1 recites:

> 1. An image processing apparatus comprising:
>
> reduced image generation means for generating a reduced
> image based on a logarithmic luminance logL(p) of a frame;
>
> correction information acquisition means for acquiring
> correction information of the frame based on the reduced
> image; and
>
> grayscale conversion means for converting grayscale of the
> frame;

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[1] The Office Action contains a number of statements reflecting characterizations of the related art and the claims. Regardless of whether any such statement is identified herein, Applicant declines to automatically subscribe to any statement or characterization in the Office Action.

wherein the grayscale conversion means corrects contrast of
the frame using the correction information, as a processing
to be performed before and/or after the grayscale is
converted.

Neither *Sonoda* nor *Takemoto* discloses at least the reduced generation means and the correction information acquisition means, as recited in claim 1.

Sonoda does not disclose "generating a reduced image based on a logarithmic luminance logL(p) of a frame," as recited in claim 1. (Final Office Action at p. 3.) *Sonoda*, thus, cannot disclose a "correction information acquisition means for acquiring information of the frame *based on the reduced image*," as recited in claim 1 (emphasis added). *Takemoto* fails to cure the deficiencies of *Sonoda*.

Takemoto discloses, "an image processing apparatus 1 in the first embodiment comprises . . . logarithmic conversion means 4 for obtaining image data D1 by carrying out logarithmic conversion on the image data D0." col. 9, line 66 to col. 10, line 6. *Takemoto* does not disclose "generating a reduced image based on a logarithmic luminance logL(p) of a frame," as recited in claim 1. *Takemoto* also does not disclose a "correction information acquisition means for acquiring information of the frame *based on the reduced image*," as recited in claim 1 (emphasis added).

Accordingly, *Sodona* and *Takemoto* fail to render the subject matter of claim 1 obvious. Claim 8, though different in scope than claim 1, is allowable over the combination of *Sodona* and *Takemoto* for at least the same reasons as claim 1. Claim 2 depends from claim 1 and thus is allowable over the combination of *Sodona* and *Takemoto* for at least the same reasons as claim 1.

Applicant respectfully traverses the rejection of claims 3-5 under 35 U.S.C. § 103(a) as being unpatentable over the combination of *Sonoda* and *Takemoto* and further in view of *Gonzalez*. A *prima facie* case of obviousness has not been established. Claims 3-5 depend from claim 1 and thus are allowable over the combination of *Sonoda* and *Takemoto* for at least the same reasons as claim 1. *Gonzalez* fails to cure the deficiencies of *Sonoda* and *Takemoto*.

Neither *Sonoda* nor *Takemoto* discloses "gain value setting means for setting a gain value g used for correcting the contrast; wherein the grayscale conversion means generates a contrast-corrected image based on luminance L_c of pixels composing the frame, luminance L_1 of pixels composing the smoothed image, and a predetermined gain value g; and the gain value setting means can be configured so as to set the gain value g based on input initial gain value g_0, reference gain value 1, and an attenuation value $attn(Th_1, Th_2, L_c)$ calculated using a first luminance threshold value Th_1, a second luminance threshold value Th_2, and luminance L_c of pixels composing the frame," as recited in claim 3. (Final Office Action at 5.)

Gonzalez discloses "a contrast-stretching transformation." (*Gonzalez* at 85.) *Gonzalez* also discloses, "[t]he idea behind contrast stretching is to increase the dynamic range of the gray levels in the image being processed." (*Gonzalez* at 85.) *Gonzalez* does not disclose a "gain value setting means," as recited in claim 3. *Gonzalez* also does not disclose "*smoothing means for generating a smoothed image having luminance L_c of pixels composing the frame smoothed based on interpolation calculation using pixels composing the reduced image*," and thus, *Gonzalez* cannot disclose "the grayscale conversion means *generates a contrast-corrected image based*

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on luminance L_c of pixels composing the frame, luminance L_1 of pixels composing the

smoothed image, and a predetermined gain value g," as recited in claim 3 (emphasis

added). Moreover, Gonzalez does not disclose, "the gain value setting means can be

configured so as to set the gain value g based on input initial gain value g_0, reference

gain value 1, and an attenuation value attn(Th_1, Th_2, L_c) calculated using a first

luminance threshold value Th_1, a second luminance threshold value Th_2, and luminance

L_c of pixels composing the frame," as recited in claim 3 (emphasis added).

None of Sodona, Takemoto, or Gonzalez discloses a "gain value setting means

for setting a gain value g used for correcting the contrast based on an initial gain value

g_0 which expresses and inverse $1/\gamma$ of a slope γ of the conversion function," as recited

in claim 4. (Final Office Action at 7.)

Sodona, Takemoto, and Gonzalez, even if combined, do not disclose "the

reduced image generation means generates a reduced image by converting the frame

into a tone-converted image based on a conversion function and reducing a size of the

tone-converted image; the correction information acquisition means acquires correction

information including a slope of the conversion function; and the grayscale conversion

means corrects contrast of the tone-converted image based on the reduced image and

the slope of the conversion function," as recited in claim 5.

Applicant respectfully traverses the rejection of claim 7 under 35 U.S.C. § 103(a)

as being unpatentable over the combination of Sonoda, Takemoto, and Gonzalez and

further in view of Tamura. A prima facie case of obviousness has not been established.

Claim 7 depends from claim 1 and thus is allowable over the combination of

Sonoda and Takemoto for at least the same reasons as claim 1. Claim 7 depends from

claim 5 and thus is allowable over the combination of *Sonoda*, *Takemoto*, and *Gonzalez* for at least the same reasons as claim 5. *Tamura* fails to cure the deficiencies of *Sonoda*, *Takemoto*, and *Gonzalez*.

The combination of *Sonoda*, *Takemoto*, and *Gonzalez* does not disclose "the hold means holds the reduced image corresponding to a previous frame's image and a slope of the conversion function applied to the previous frame's image, and the grayscale conversion means corrects the contrast of the tone-converted image based on the reduced image of the previous frame and the slope of the conversion function, both stored in the hold means," as recited in claim 7. (Final Office Action at 8.)

Tamura discloses "the correction coefficient (γ) for the previous frame held in a correction gamma register 17" and "the adder 36 provides the same correction coefficient as that of the previous frame." (col. 7, lines 17-18, 45-46.) *Tamura* does not disclose "the hold means holds *the reduced image* corresponding to a previous frame's image" or "the grayscale conversion means corrects the contrast of the tone-converted image *based on the reduced image* of the previous frame," as recited in claim 7 (emphasis added).
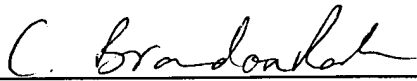
In view of the foregoing remarks, Applicant respectfully requests reconsideration of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge

any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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